SEQUENCE LISTING

<110> Herman, Ira
Welch, Alice

<120> BETA-CAP73 CONTROL OF NORMAL AND
ABNORMAL CELL MIGRATION

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<141> 2000-12-28

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gtctctctga gggctggctt tgtgagccac agtgatttgt aacttaatgc gaactaattt 360
gctgttagca acaagaaact aaatcctgtc t atg atg agc tgt tgg ttt tct    412
                                    Met Met Ser Cys Trp Phe Ser
                                     1               5

tgt gct cct aag aac aga caa gca gca gat tgg aac aaa tac gat gac    460
Cys Ala Pro Lys Asn Arg Gln Ala Ala Asp Trp Asn Lys Tyr Asp Asp
         10                  15                  20

cga ttg atg aga gca gca gaa agg gga gat gta gaa aaa gtg tcc tca    508
Arg Leu Met Arg Ala Ala Glu Arg Gly Asp Val Glu Lys Val Ser Ser
     25                  30                  35

atc ctt gct aaa aag gga gtc aat cca ggc aag cta gat gta gaa ggc    556
Ile Leu Ala Lys Lys Gly Val Asn Pro Gly Lys Leu Asp Val Glu Gly
 40                  45                  50                  55

aga tct gcc ttt cat gtt gtg gcc tca aag gga aat ctt gag tgt ttg    604
Arg Ser Ala Phe His Val Val Ala Ser Lys Gly Asn Leu Glu Cys Leu
                 60                  65                  70

aat gcc atc ctc ata cat gga gtt gat att aca acc agt gac acc gca    652
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Asn Ala Ile Leu Ile His Gly Val Asp Ile Thr Thr Ser Asp Thr Ala
             75              80              85

gga agg aat gct ctt cac ctg gct gca aag tat ggg cat gca ctg tgt      700
Gly Arg Asn Ala Leu His Leu Ala Ala Lys Tyr Gly His Ala Leu Cys
             90              95             100

cta caa aaa ctt cta cag tac aat tgt ccc act gaa cat gta gac ctg      748
Leu Gln Lys Leu Leu Gln Tyr Asn Cys Pro Thr Glu His Val Asp Leu
        105             110             115

cag gga aga act gca ctt cat gat gca gct atg gca gac tgt cct tct      796
Gln Gly Arg Thr Ala Leu His Asp Ala Ala Met Ala Asp Cys Pro Ser
120             125             130             135

agc ata cag ctg ctc tgc gac cat ggg gcc tcg gtg aat gcc aaa gat      844
Ser Ile Gln Leu Leu Cys Asp His Gly Ala Ser Val Asn Ala Lys Asp
                140             145             150

gta gat ggg cgg aca cca ctt gtt ctg gct acc cag atg tgt agg cca      892
Val Asp Gly Arg Thr Pro Leu Val Leu Ala Thr Gln Met Cys Arg Pro
             155             160             165

aca ata tgt caa ctg ctg ata gat aga ggg gcg gat att aat tcc aga      940
Thr Ile Cys Gln Leu Leu Ile Asp Arg Gly Ala Asp Ile Asn Ser Arg
             170             175             180

gac aaa caa aac agg act gct ctc atg cta gga tgc gag tat ggt tgc      988
Asp Lys Gln Asn Arg Thr Ala Leu Met Leu Gly Cys Glu Tyr Gly Cys
        185             190             195

aaa gat gca gta gaa gtc tta atc aaa aac ggc gct gac gtg acc ttg      1036
Lys Asp Ala Val Glu Val Leu Ile Lys Asn Gly Ala Asp Val Thr Leu
200             205             210             215

ctg gac gcc ctt ggc cat gac agt tct tac tat gca aga att ggt gac      1084
Leu Asp Ala Leu Gly His Asp Ser Ser Tyr Tyr Ala Arg Ile Gly Asp
             220             225             230

aat ctg gac att cta acc tta ctg aag act gca tca gaa aat tcc aac      1132
Asn Leu Asp Ile Leu Thr Leu Leu Lys Thr Ala Ser Glu Asn Ser Asn
             235             240             245

aaa ggg aga gaa ctt tgg aag aaa gga cca tct tta caa cag cga aat      1180
Lys Gly Arg Glu Leu Trp Lys Lys Gly Pro Ser Leu Gln Gln Arg Asn
             250             255             260

ttg tct cag atg cta gat gaa gta aat acg aag tca aat cag agg gag      1228
Leu Ser Gln Met Leu Asp Glu Val Asn Thr Lys Ser Asn Gln Arg Glu
             265             270             275

cat caa aac att cag gat ctg gag att gaa aat gaa gat ctg aaa gag      1276
His Gln Asn Ile Gln Asp Leu Glu Ile Glu Asn Glu Asp Leu Lys Glu
280             285             290             295

aga ttg aga aaa att cag caa gaa cag aga ata tta ttg gat aaa gtc      1324
Arg Leu Arg Lys Ile Gln Gln Glu Gln Arg Ile Leu Leu Asp Lys Val
             300             305             310

aat ggt tta cag cta cag ctg aat gag gaa gta atg gtg gct gat gat      1372
Asn Gly Leu Gln Leu Gln Leu Asn Glu Glu Val Met Val Ala Asp Asp
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                 315                      320                      325

ctg gaa agt gag aaa gaa aag ctg aag tcc ctt ttg gca gcc aaa gaa   1420
Leu Glu Ser Glu Lys Glu Lys Leu Lys Ser Leu Leu Ala Ala Lys Glu
        330             335             340

aag cag cat gaa gaa agc cta aga act att gag gct ctg aaa agt aga   1468
Lys Gln His Glu Glu Ser Leu Arg Thr Ile Glu Ala Leu Lys Ser Arg
        345             350             355

ttt aag tat ttt gag agt gat cat tta gga tca gga agt cat ttc agg   1516
Phe Lys Tyr Phe Glu Ser Asp His Leu Gly Ser Gly Ser His Phe Arg
360             365             370             375

aaa gaa gat atg ctt ctt aaa caa ggt caa atg tac atg aca gac tca   1564
Lys Glu Asp Met Leu Leu Lys Gln Gly Gln Met Tyr Met Thr Asp Ser
            380             385             390

cag tgt act tcc aca ggc atg cca gtc cat atg caa agc cga tct atg   1612
Gln Cys Thr Ser Thr Gly Met Pro Val His Met Gln Ser Arg Ser Met
            395             400             405

tta aga cca ctg gag cta gcc tta cct aat caa gcc tca tat tcg gaa   1660
Leu Arg Pro Leu Glu Leu Ala Leu Pro Asn Gln Ala Ser Tyr Ser Glu
        410             415             420

aac gaa att tta aag aaa gaa tta gaa gca atg aga act ttc tgt gat   1708
Asn Glu Ile Leu Lys Lys Glu Leu Glu Ala Met Arg Thr Phe Cys Asp
        425             430             435

tca gca aaa caa gac aga ctc aaa ctc caa aat gaa ctg gct cac aag   1756
Ser Ala Lys Gln Asp Arg Leu Lys Leu Gln Asn Glu Leu Ala His Lys
440             445             450             455

gtg gcg gag tgc aag gcc tta gca ttg gaa tgt gaa agg gtg aaa gag   1804
Val Ala Glu Cys Lys Ala Leu Ala Leu Glu Cys Glu Arg Val Lys Glu
            460             465             470

gat tca gat gag cag ata aag caa cta gaa gat gcc ttg aaa gac gtg   1852
Asp Ser Asp Glu Gln Ile Lys Gln Leu Glu Asp Ala Leu Lys Asp Val
            475             480             485

cag aag aga atg tat gag tcg gaa ggt aaa gtg aaa caa atg cag aca   1900
Gln Lys Arg Met Tyr Glu Ser Glu Gly Lys Val Lys Gln Met Gln Thr
            490             495             500

cat ttt ctt gcc ttg aaa gag cac ctg aca agt gat gcg gcc act ggg   1948
His Phe Leu Ala Leu Lys Glu His Leu Thr Ser Asp Ala Ala Thr Gly
        505             510             515

aac cac agg ctg atg gag gaa ctg aag gat cag ttg aaa gac atg aaa   1996
Asn His Arg Leu Met Glu Glu Leu Lys Asp Gln Leu Lys Asp Met Lys
520             525             530             535

gtg aaa tac gaa ggt gcg tcc gca gaa gtg ggg aaa ttg aga aac caa   2044
Val Lys Tyr Glu Gly Ala Ser Ala Glu Val Gly Lys Leu Arg Asn Gln
            540             545             550

atc aaa caa aat gaa atg tta gtt gaa gag ttt aag aga gat gag ggc   2092
Ile Lys Gln Asn Glu Met Leu Val Glu Glu Phe Lys Arg Asp Glu Gly
            555             560             565
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aag ctg atg gaa gag aat aag cga ctg cag aag gag ttg agc atg tgt    2140
Lys Leu Met Glu Glu Asn Lys Arg Leu Gln Lys Glu Leu Ser Met Cys
        570             575             580

gaa ctg gag cga gag aag aga gga agg aag ctc act gag atg gaa ggc    2188
Glu Leu Glu Arg Glu Lys Arg Gly Arg Lys Leu Thr Glu Met Glu Gly
    585             590             595

cag tta aag gac ttg tca gcc aag ctg gcc ctt tct att cca gca gag    2236
Gln Leu Lys Asp Leu Ser Ala Lys Leu Ala Leu Ser Ile Pro Ala Glu
600             605             610             615

aaa ttt gaa aac atg aag agc ttg tta tca aat gaa ctg aac gag aag    2284
Lys Phe Glu Asn Met Lys Ser Leu Leu Ser Asn Glu Leu Asn Glu Lys
                620             625             630

gca aaa aaa tta ata gat gtg gaa aga gaa tat gaa aga tca ctt aat    2332
Ala Lys Lys Leu Ile Asp Val Glu Arg Glu Tyr Glu Arg Ser Leu Asn
            635             640             645

gaa act aga cca tta aag aga gaa ctt gag aat ttg aag gcc aaa ctg    2380
Glu Thr Arg Pro Leu Lys Arg Glu Leu Glu Asn Leu Lys Ala Lys Leu
        650             655             660

gct cag cac gtc aaa cca gag gaa cat gag cag ctc aag agc aga tta    2428
Ala Gln His Val Lys Pro Glu Glu His Glu Gln Leu Lys Ser Arg Leu
        665             670             675

gag cag aag tca gga gaa ctt ggg aag agg atc act gag tta aca tcg    2476
Glu Gln Lys Ser Gly Glu Leu Gly Lys Arg Ile Thr Glu Leu Thr Ser
680             685             690             695

aaa aat cag acg tta caa aag gaa atc gaa aag gtc tgc ctg gat aat    2524
Lys Asn Gln Thr Leu Gln Lys Glu Ile Glu Lys Val Cys Leu Asp Asn
            700             705             710

aag ctc ctt aca caa caa gta aat aac tta aca act gaa atg aaa aat    2572
Lys Leu Leu Thr Gln Gln Val Asn Asn Leu Thr Thr Glu Met Lys Asn
            715             720             725

gtc cct tta aaa gta agt gaa gaa atg aaa aag tca cat gat gta att    2620
Val Pro Leu Lys Val Ser Glu Glu Met Lys Lys Ser His Asp Val Ile
        730             735             740

gtt gat gat ttg aat aaa aag ctt tca gat gtg aca cac aaa tat aca    2668
Val Asp Asp Leu Asn Lys Lys Leu Ser Asp Val Thr His Lys Tyr Thr
        745             750             755

gaa aag aag ttg gaa atg gag aag ttg ctt atg gaa aat gcc agt tta    2716
Glu Lys Lys Leu Glu Met Glu Lys Leu Leu Met Glu Asn Ala Ser Leu
760             765             770             775

agt aaa aat gtc agc cgc ctg gaa act gtg ttc ata cct ccc gag aga    2764
Ser Lys Asn Val Ser Arg Leu Glu Thr Val Phe Ile Pro Pro Glu Arg
            780             785             790

cac gaa aaa gaa atg atg gct ctg aaa tcc aat atc act gaa ctt aag    2812
His Glu Lys Glu Met Met Ala Leu Lys Ser Asn Ile Thr Glu Leu Lys
        795             800             805
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aag cag ctg tct gaa ctt aat aaa aaa tgt ggt gaa gac caa gag aaa   2860
Lys Gln Leu Ser Glu Leu Asn Lys Lys Cys Gly Glu Asp Gln Glu Lys
        810             815             820

ata tat tca ctc atg tct gaa aac aat gat ttg aaa aag acc atg agt   2908
Ile Tyr Ser Leu Met Ser Glu Asn Asn Asp Leu Lys Lys Thr Met Ser
        825             830             835

cat cag tat gtg ccc gtg aaa acc cat gaa gag att aaa act gcc ttg   2956
His Gln Tyr Val Pro Val Lys Thr His Glu Glu Ile Lys Thr Ala Leu
840             845             850             855

agt agc aca ttg gat aaa acc aat aga gaa tta gta gat gtg aag aag   3004
Ser Ser Thr Leu Asp Lys Thr Asn Arg Glu Leu Val Asp Val Lys Lys
            860             865             870

aag tgt gaa gat ata aat caa gaa ttt gtg aaa ata aaa gat gag aac   3052
Lys Cys Glu Asp Ile Asn Gln Glu Phe Val Lys Ile Lys Asp Glu Asn
            875             880             885

gaa ata tta aaa aga aat ctg gag aac act cag aac caa gta aaa gct   3100
Glu Ile Leu Lys Arg Asn Leu Glu Asn Thr Gln Asn Gln Val Lys Ala
            890             895             900

gag tac atc agc cta aga gag cat gaa gaa aag atg agt ggc cta agg   3148
Glu Tyr Ile Ser Leu Arg Glu His Glu Glu Lys Met Ser Gly Leu Arg
        905             910             915

aag agc atg aag aag gtc cag gac aac agc gct gaa ata ctg gct aag   3196
Lys Ser Met Lys Lys Val Gln Asp Asn Ser Ala Glu Ile Leu Ala Lys
920             925             930             935

tac aaa aaa agc cag gag gag att gtc acc ctg cat gag gag att gca   3244
Tyr Lys Lys Ser Gln Glu Glu Ile Val Thr Leu His Glu Glu Ile Ala
            940             945             950

gcc cag aag aga gaa ctc gac acg ata cag gaa tgc atc aag cta aaa   3292
Ala Gln Lys Arg Glu Leu Asp Thr Ile Gln Glu Cys Ile Lys Leu Lys
            955             960             965

tat gct ccg atc atc agc ttg gaa gag tgt gag aga aaa ttt aaa gcc   3340
Tyr Ala Pro Ile Ile Ser Leu Glu Glu Cys Glu Arg Lys Phe Lys Ala
        970             975             980

act gag aaa gaa cta aaa gaa cag cta tcc cag cag aca cag aag tat   3388
Thr Glu Lys Glu Leu Lys Glu Gln Leu Ser Gln Gln Thr Gln Lys Tyr
        985             990             995

aat acc agt gaa gaa gag gcc aag aag tgc aag caa gag aat gac aag   3436
Asn Thr Ser Glu Glu Glu Ala Lys Lys Cys Lys Gln Glu Asn Asp Lys
1000            1005            1010            1015

tta aag aag gag atc ctc act ctt cag aag gat cta aag gat aag aat   3484
Leu Lys Lys Glu Ile Leu Thr Leu Gln Lys Asp Leu Lys Asp Lys Asn
            1020            1025            1030

gtt cac att gag aat tct tat gaa aca gaa aga gca tta agc aga aaa   3532
Val His Ile Glu Asn Ser Tyr Glu Thr Glu Arg Ala Leu Ser Arg Lys
            1035            1040            1045

aca gaa gag ctg aac aga cag tta aaa gac ctg ttg cag aaa tac aca   3580
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                Thr Glu Glu   Leu Asn Arg Gln Leu   Lys Asp Leu Leu Gln   Lys Tyr Thr
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gag gca   aag aag gag aaa gag   aag ctc gtg gag gaa   aat gcc aag cag      3628
Glu Ala   Lys Lys Glu Lys Glu   Lys Leu Val Glu Glu   Asn Ala Lys Gln
    1065              1070                1075


act   tct gag atc ctt gca   gca caa act ctt ttg   cag aag cag cat gtt      3676
Thr   Ser Glu Ile Leu Ala   Ala Gln Thr Leu Leu   Gln Lys Gln His Val
1080              1085                1090                    1095


ccg ctg gag cag gtt   gag tcc ctg aaa aaa   tct ctt agt ggt aca   atc      3724
Pro Leu Glu Gln Val   Glu Ser Leu Lys Lys   Ser Leu Ser Gly Thr   Ile
              1100                1105                1110


gag aca ctc aag   gaa gaa ctg aaa act   aag cag aga tgt tat   gag aaa      3772
Glu Thr Leu Lys   Glu Glu Leu Lys Thr   Lys Gln Arg Cys Tyr   Glu Lys
              1115                1120                1125


gag cag cag   aca gtg acc caa ctg   cgg cag atg ctg gag   aat cag aag      3820
Glu Gln Gln   Thr Val Thr Gln Leu   Arg Gln Met Leu Glu   Asn Gln Lys
          1130                1135                    1140


aac tcc   tct gtg ccc ctg gct   gag cat ttg cag gtt   aag gaa gca ttt      3868
Asn Ser   Ser Val Pro Leu Ala   Glu His Leu Gln Val   Lys Glu Ala Phe
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gag   aaa gaa gtt gga atc   ata aaa gct agc ttg   aga gaa aag gaa gaa      3916
Glu   Lys Glu Val Gly Ile   Ile Lys Ala Ser Leu   Arg Glu Lys Glu Glu
1160              1165                1170                    1175


gaa agc caa aac aaa   act gaa gag gtc tcc   aaa ctc cag tct gag   att      3964
Glu Ser Gln Asn Lys   Thr Glu Glu Val Ser   Lys Leu Gln Ser Glu   Ile
              1180                1185                1190


cag aat act aaa   caa gcg tta aaa aaa   tta gag act cgg gag   gtg gtt      4012
Gln Asn Thr Lys   Gln Ala Leu Lys Lys   Leu Glu Thr Arg Glu   Val Val
              1195                1200                1205


gat ttg tcg   aaa tat aaa gca acg   aaa agc gat ttg gag   aca cag att      4060
Asp Leu Ser   Lys Tyr Lys Ala Thr   Lys Ser Asp Leu Glu   Thr Gln Ile
          1210                1215                1220


tcc gac tta aac gaa aaa ttg gcc aat ctg aat agg aag tat gag gaa          4108
Ser Asp Leu Asn Glu Lys Leu Ala Asn Leu Asn Arg Lys Tyr Glu Glu
    1225              1230                1235


gta tgt gag gag gtt ttg cat gcc aaa aag aag gaa ctg tct gct aaa          4156
Val Cys Glu Glu Val Leu His Ala Lys Lys Lys Glu Leu Ser Ala Lys
1240              1245                1250                    1255


gat gag aag gaa ttg ctc cat ttc agc ata gag caa gaa atc aaa gat          4204
Asp Glu Lys Glu Leu Leu His Phe Ser Ile Glu Gln Glu Ile Lys Asp
                  1260                1265                1270


cag cag gaa cga tgt gac aaa tcc tta aca acc atc acg gag cta cag          4252
Gln Gln Glu Arg Cys Asp Lys Ser Leu Thr Thr Ile Thr Glu Leu Gln
              1275                1280                1285


aga aga ata cag gaa tct gcc aaa caa atc gaa gca aaa gat aat aag          4300
Arg Arg Ile Gln Glu Ser Ala Lys Gln Ile Glu Ala Lys Asp Asn Lys
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          1290                    1295                    1300
ata act gaa ctg ctc aat gat gtg gag aga tta aaa cag gcc ctc aat    4348
Ile Thr Glu Leu Leu Asn Asp Val Glu Arg Leu Lys Gln Ala Leu Asn
    1305                    1310                    1315

ggc ctt tcc cag ctc acc tat gga agt ggg agt ccc agc aag agg cag    4396
Gly Leu Ser Gln Leu Thr Tyr Gly Ser Gly Ser Pro Ser Lys Arg Gln
1320                    1325                    1330                    1335

agt cag ctg att gac agc ctg cag cag cag gtc agg tcc ctg cag cag    4444
Ser Gln Leu Ile Asp Ser Leu Gln Gln Gln Val Arg Ser Leu Gln Gln
                    1340                    1345                    1350

cag ctg gcg gat gcc gac aga cag cac caa gaa gta att gca att tat    4492
Gln Leu Ala Asp Ala Asp Arg Gln His Gln Glu Val Ile Ala Ile Tyr
                1355                    1360                    1365

cgg aca cac ctt ctt agt gct gca cag ggt cac atg gat gag gat gtg    4540
Arg Thr His Leu Leu Ser Ala Ala Gln Gly His Met Asp Glu Asp Val
                1370                    1375                    1380

cag gcc gcc tta ctg cag atc ata cag atg cgg cag ggg ctc gtg tgc    4588
Gln Ala Ala Leu Leu Gln Ile Ile Gln Met Arg Gln Gly Leu Val Cys
            1385                    1390                    1395

tag tcg gca cccccagcc cacagtggct ttccctgctg gtgctgagca             4637
 *  Ser Ala
        1400


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Asp Val Glu Lys Val Ser Ser Ile Leu Ala Lys Lys Gly Val Asn Pro
        35                  40                  45
Gly Lys Leu Asp Val Glu Gly Arg Ser Ala Phe His Val Val Ala Ser
    50                  55                  60
Lys Gly Asn Leu Glu Cys Leu Asn Ala Ile Leu Ile His Gly Val Asp
65                  70                  75                  80
Ile Thr Thr Ser Asp Thr Ala Gly Arg Asn Ala Leu His Leu Ala Ala
                85                  90                  95
Lys Tyr Gly His Ala Leu Cys Leu Gln Lys Leu Leu Gln Tyr Asn Cys
            100                 105                 110
Pro Thr Glu His Val Asp Leu Gln Gly Arg Thr Ala Leu His Asp Ala
        115                 120                 125
Ala Met Ala Asp Cys Pro Ser Ser Ile Gln Leu Leu Cys Asp His Gly
        130                 135                 140
Ala Ser Val Asn Ala Lys Asp Val Asp Gly Arg Thr Pro Leu Val Leu
145                 150                 155                 160
Ala Thr Gln Met Cys Arg Pro Thr Ile Cys Gln Leu Leu Ile Asp Arg
                165                 170                 175
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Gly Ala Asp Ile Asn Ser Arg Asp Lys Gln Asn Arg Thr Ala Leu Met
            180                 185                 190
Leu Gly Cys Glu Tyr Gly Cys Lys Asp Ala Val Glu Val Leu Ile Lys
        195                 200                 205
Asn Gly Ala Asp Val Thr Leu Leu Asp Ala Leu Gly His Asp Ser Ser
    210                 215                 220
Tyr Tyr Ala Arg Ile Gly Asp Asn Leu Asp Ile Leu Thr Leu Leu Lys
225                 230                 235                 240
Thr Ala Ser Glu Asn Ser Asn Lys Gly Arg Glu Leu Trp Lys Lys Gly
            245                 250                 255
Pro Ser Leu Gln Gln Arg Asn Leu Ser Gln Met Leu Asp Glu Val Asn
            260                 265                 270
Thr Lys Ser Asn Gln Arg Glu His Gln Asn Ile Gln Asp Leu Glu Ile
        275                 280                 285
Glu Asn Glu Asp Leu Lys Glu Arg Leu Arg Lys Ile Gln Gln Glu Gln
    290                 295                 300
Arg Ile Leu Leu Asp Lys Val Asn Gly Leu Gln Leu Gln Leu Asn Glu
305                 310                 315                 320
Glu Val Met Val Ala Asp Asp Leu Glu Ser Glu Lys Glu Lys Leu Lys
            325                 330                 335
Ser Leu Leu Ala Ala Lys Glu Lys Gln His Glu Glu Ser Leu Arg Thr
            340                 345                 350
Ile Glu Ala Leu Lys Ser Arg Phe Lys Tyr Phe Glu Ser Asp His Leu
        355                 360                 365
Gly Ser Gly Ser His Phe Arg Lys Glu Asp Met Leu Leu Lys Gln Gly
    370                 375                 380
Gln Met Tyr Met Thr Asp Ser Gln Cys Thr Ser Thr Gly Met Pro Val
385                 390                 395                 400
His Met Gln Ser Arg Ser Met Leu Arg Pro Leu Glu Leu Ala Leu Pro
            405                 410                 415
Asn Gln Ala Ser Tyr Ser Glu Asn Glu Ile Leu Lys Lys Glu Leu Glu
            420                 425                 430
Ala Met Arg Thr Phe Cys Asp Ser Ala Lys Gln Asp Arg Leu Lys Leu
            435                 440                 445
Gln Asn Glu Leu Ala His Lys Val Ala Glu Cys Lys Ala Leu Ala Leu
    450                 455                 460
Glu Cys Glu Arg Val Lys Glu Asp Ser Asp Glu Gln Ile Lys Gln Leu
465                 470                 475                 480
Glu Asp Ala Leu Lys Asp Val Gln Lys Arg Met Tyr Glu Ser Glu Gly
            485                 490                 495
Lys Val Lys Gln Met Gln Thr His Phe Leu Ala Leu Lys Glu His Leu
            500                 505                 510
Thr Ser Asp Ala Ala Thr Gly Asn His Arg Leu Met Glu Glu Leu Lys
        515                 520                 525
Asp Gln Leu Lys Asp Met Lys Val Lys Tyr Glu Gly Ala Ser Ala Glu
    530                 535                 540
Val Gly Lys Leu Arg Asn Gln Ile Lys Gln Asn Glu Met Leu Val Glu
545                 550                 555                 560
Glu Phe Lys Arg Asp Glu Gly Lys Leu Met Glu Glu Asn Lys Arg Leu
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Gln Lys Glu Leu Ser Met Cys Glu Leu Glu Arg Glu Lys Arg Gly Arg
            580                 585                 590
Lys Leu Thr Glu Met Glu Gly Gln Leu Lys Asp Leu Ser Ala Lys Leu
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Ala Leu Ser Ile Pro Ala Glu Lys Phe Glu Asn Met Lys Ser Leu Leu
    610                 615                 620
Ser Asn Glu Leu Asn Glu Lys Ala Lys Lys Leu Ile Asp Val Glu Arg
625                 630                 635                 640
Glu Tyr Glu Arg Ser Leu Asn Glu Thr Arg Pro Leu Lys Arg Glu Leu
            645                 650                 655
Glu Asn Leu Lys Ala Lys Leu Ala Gln His Val Lys Pro Glu Glu His
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                660                 665                  670
Glu Gln Leu Lys Ser Arg Leu Glu Gln Lys Ser Gly Glu Leu Gly Lys
        675                 680                 685
Arg Ile Thr Glu Leu Thr Ser Lys Asn Gln Thr Leu Gln Lys Glu Ile
    690                 695                 700
Glu Lys Val Cys Leu Asp Asn Lys Leu Leu Thr Gln Gln Val Asn Asn
705                 710                 715                 720
Leu Thr Thr Glu Met Lys Asn Val Pro Leu Lys Val Ser Glu Glu Met
                725                 730                 735
Lys Lys Ser His Asp Val Ile Val Asp Asp Leu Asn Lys Lys Leu Ser
                740                 745                 750
Asp Val Thr His Lys Tyr Thr Glu Lys Lys Leu Glu Met Glu Lys Leu
        755                 760                 765
Leu Met Glu Asn Ala Ser Leu Ser Lys Asn Val Ser Arg Leu Glu Thr
    770                 775                 780
Val Phe Ile Pro Pro Glu Arg His Glu Lys Glu Met Met Ala Leu Lys
785                 790                 795                 800
Ser Asn Ile Thr Glu Leu Lys Lys Gln Leu Ser Glu Leu Asn Lys Lys
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Cys Gly Glu Asp Gln Glu Lys Ile Tyr Ser Leu Met Ser Glu Asn Asn
                820                 825                 830
Asp Leu Lys Lys Thr Met Ser His Gln Tyr Val Pro Val Lys Thr His
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Glu Glu Ile Lys Thr Ala Leu Ser Ser Thr Leu Asp Lys Thr Asn Arg
    850                 855                 860
Glu Leu Val Asp Val Lys Lys Lys Cys Glu Asp Ile Asn Gln Glu Phe
865                 870                 875                 880
Val Lys Ile Lys Asp Glu Asn Glu Ile Leu Lys Arg Asn Leu Glu Asn
                885                 890                 895
Thr Gln Asn Gln Val Lys Ala Glu Tyr Ile Ser Leu Arg Glu His Glu
            900                 905                 910
Glu Lys Met Ser Gly Leu Arg Lys Ser Met Lys Lys Val Gln Asp Asn
        915                 920                 925
Ser Ala Glu Ile Leu Ala Lys Tyr Lys Lys Ser Gln Glu Glu Ile Val
    930                 935                 940
Thr Leu His Glu Glu Ile Ala Ala Gln Lys Arg Glu Leu Asp Thr Ile
945                 950                 955                 960
Gln Glu Cys Ile Lys Leu Lys Tyr Ala Pro Ile Ile Ser Leu Glu Glu
                965                 970                 975
Cys Glu Arg Lys Phe Lys Ala Thr Glu Lys Glu Leu Lys Glu Gln Leu
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Ser Gln Gln Thr Gln Lys Tyr Asn Thr Ser Glu Glu Glu Ala Lys Lys
        995                 1000                1005
Cys Lys Gln Glu Asn Asp Lys Leu Lys Lys Glu Ile Leu Thr Leu Gln
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Lys  Asp Leu Lys Asp Lys Asn Val His Ile Glu Asn Ser Tyr Glu Thr
1025                1030                1035                1040
Glu Arg Ala Leu Ser Arg Lys Thr Glu Glu Leu Asn Arg Gln Leu Lys
                1045                1050                1055
Asp Leu Leu Gln Lys Tyr Thr Glu Ala Lys Lys Glu Lys Glu Lys Leu
        1060                1065                1070
Val Glu Glu  Asn Ala Lys Gln Thr Ser Glu Ile Leu Ala Ala Gln Thr
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Leu Leu Gln Lys Gln His Val Pro Leu Glu Gln Val Glu Ser Leu Lys
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Lys Ser Leu Ser Gly Thr Ile Glu Thr Leu Lys Glu Glu Leu Lys Thr
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Lys Gln Arg Cys Tyr Glu Lys Glu Gln Gln Thr Val Thr Gln Leu Arg
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Gln Met Leu Glu Asn Gln Lys Asn Ser Ser Val Pro Leu Ala Glu His
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Leu Gln Val  Lys Glu Ala Phe Glu Lys Glu Val Gly Ile Ile Lys Ala
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Ser Lys Leu Gln Ser Glu Ile Gln Asn Thr Lys Gln Ala Leu Lys Lys
1185              1190              1195              1200
Leu Glu Thr Arg Glu  Val Val Asp Leu Ser Lys Tyr Lys Ala Thr Lys
            1205,             1210              1215
Ser Asp Leu Glu Thr Gln Ile Ser Asp Leu Asn Glu Lys Leu Ala Asn
        1220              1225              1230
Leu Asn Arg Lys Tyr Glu Glu Val Cys Glu Glu Val Leu His Ala Lys
        1235              1240              1245
Lys Lys Glu Leu Ser Ala Lys Asp Glu Lys Glu Leu Leu His Phe Ser
        1250              1255              1260
Ile Glu Gln Glu Ile Lys Asp Gln Gln Glu Arg Cys Asp Lys Ser Leu
1265              1270              1275              1280
Thr Thr Ile Thr Glu  Leu Gln Arg Arg Ile Gln Glu Ser Ala Lys Gln
            1285              1290              1295
Ile Glu Ala Lys Asp Asn Lys Ile Thr Glu Leu Leu Asn Asp Val Glu
        1300              1305              1310
Arg Leu Lys Gln Ala Leu Asn Gly Leu Ser Gln Leu Thr Tyr Gly Ser
   · 1315              1320              1325
Gly Ser Pro Ser Lys Arg Gln Ser Gln Leu Ile Asp Ser Leu Gln Gln
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Gln  Val Arg Ser Leu Gln Gln Gln Leu Ala Asp Ala Asp Arg Gln His
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Gln Glu Val Ile Ala Ile Tyr Arg Thr His Leu Leu Ser Ala Ala Gln
            1365              1370              1375
Gly His Met Asp Glu Asp Val Gln Ala Ala Leu Leu Gln Ile Ile Gln
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<212> DNA
<213> Bos taurus

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ggaagaactg cacttcatga tgcagctatg gcagactgtc cttctagcat acagctgctc 420
tgcgaccatg gggcctcggt gaatgccaaa gatgtagatg ggcggacacc acttgttctg 480
gctacccaga tgtgtaggcc aacaatatgt caactgctga tagatagagg ggcggatatt 540
aattccagag acaaacaaaa caggactgct ctcatgctag atgcgagta tggttgcaaa 600
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<223> Xaa may be any amino acid

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<221> VARIANT
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<220>
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<210> 10
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<220>
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<220>
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